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WALES.

CARDIFF.

By Consul Lorin A. Lathrop.

Pre-war coal exports of the world approximated 200,000,000 tons, of which the contribution of the United Kingdom ranged between 35 and 40 per cent. In 1913 the United Kingdom shipped to non-British countries and to its own world depots, colonies, and dependencies about 75,000,000 tons, while its coke and briquet output and bunker coal furnished foreign-going ships amounted to 25,000,000 tons additional. Of its total output of 287,000,000 tons it thus retained for home consumption 187,000,000 tons. Its production in 1918 was about 226,000,000 tons, of which 35,000,000 tons were shipped overseas as cargo and 25,000,000 tons supplied as bunkers and to its Admiralty Department, leaving an approximate 166,000,000 tons for home use. The grave shortage for domestic consumption, exceeding 20,000,000 tons, was coincident with heavily increased demands from war manufacturers. The shortage was met by rationing households, manufacturers of less essential commodities, and public utilities. The country was subjected to intricate regulations controlling transport, establishing zone systems, preventing long hauls from distant sources, and fixing prices at every point between pit mouth and consumer.

War Time Coal Distribution—Importance of Coal-Export Business.

Exports, which were reduced by more than half, were shipped to no country on a commercial basis. The main consideration, after providing for the British and Allied vessels, was to supply the heavy needs of the British, French, and Americans in France. Italy came next in the distribution. Distant markets were ignored, and such neutrals as obtained cargoes received them in exchange for some specific service rendered, such as vessels lent, etc. No branch of commerce was more completely disorganized by the war than the British coal-export business, and this grave disorganization reacted remarkably on the general economic life and on import trade. Coal is the unique bulk cargo which the country exports, and in the past has constituted more than 75 per cent, by weight, of all outward cargo. It is, in part, the medium of exchange with which Great Britain has paid for its South American and Russian wheat and corn, its Baltic timber, its Spanish ores, its Chilean nitrates, and its imports from West Africa. It is the vital link in the British chain of supplies. It has not only paid for bulky raw materials, but has halved their cost of inward ocean transport. On the eve of reconstruction the country

is confronted with such enhanced costs of coal production as greatly to increase the difficulties of regaining markets firmly held in pre-war times. In view of the palmary importance of this key industry, it may be expected that private enterprise, with official encouragement, will make energetic and unremitting efforts to recover lost ground. Coal-export business, especially that connected with the more distant markets, is under the control of strong firms and companies with large reserves of capital, owning or controlling cargo vessels, and having their own partners or representatives at the chief coal-importing ports of the world. It is believed that if the production of coal be nationalized, its export will be left in private hands.

Pre-War Distribution of British Coal Exports.

The following table, issued by a British departmental committee, shows the general course of the British coal-export business in the year 1913:

Districts of origin.	Shipments to—					
	Continent of Europe north of France.	Rest of Europe and African Mediterranean ports.	Europe (total), including African Mediterranean ports.	Africa, excluding Mediterranean ports.	India and the Orient.	South America.
Bristol Channel (South Wales coal ports)	*Long tons.* 1,820,000	*Long tons.* 20,723,000	*Long tons.* 22,543,000	*Long tons.* 825,000	*Long tons.* 538,000	*Long tons.* 5,896,000
Northeastern ports	12,133,000	10,502,000	22,635,000	20,000,000	29,000,000	336,000
Humber	7,008,000	1,583,000	8,591,000	5,000	21,000	262,000
East Scotland	7,050,000	1,039,000	8,089,000	2,000	.....	154,000
West Scotland	476,000	1,413,000	1,889,000	18,000	4,000	185,000
Other	518,000	508,000	1,026,000	16,000	20,000	107,000
Total	29,005,000	35,768,000	64,773,000	886,000	612,000	6,940,000

The total shipments of coal from the United Kingdom in 1913, including 189,000 tons exported to North and Central America, but not included in the preceding table, were, by districts of origin, as follows:

	Long tons.
Bristol Channel (South Wales coal fields)	29,876,000
Northeastern ports	23,024,000
Humber	8,883,000
East Scotland	8,253,000
West Scotland	2,184,000
Other	1,180,000
Total	73,400,000

These figures show that the British coal trade is no exception to the general rule that a nation's surplus coal is sold to near-by consumers. Eighty-eight per cent of British export coal (say 65,000,000 tons) is normally marketed in Europe and the Mediterranean. A small proportion, less than 1,000,000 tons, is shipped beyond Suez. This oriental market may be expected to decline in proportion as oriental coal deposits are discovered and developed. The Cape of Good Hope market has practically disappeared since the development of Durban as a coal port for distributing South American coal. The West African market is an expanding one and normally receives in excess of 750,000 tons of coal annually.

The Bristol Channel and Its Ports.

The ports of the Bristol Channel are the shipping ports of the South Wales coal field, and from them have been dispatched in the past some 50 per cent of the coal exports of the United Kingdom. Geographical conditions both inland and oceanward, and the qualities of the coal, mark it for export. The ports range from Newport, Monmouthshire, England, on the east, to Swansea, Wales, on the west, including Cardiff, Penarth, Barry, and Port Talbot. Owing to the heavy tidal movement of the Bristol Channel, the docks of all these ports are provided with locks, and entrance can only be effected at suitable states of the tide. There is no coal loading from piers projecting into tidal waters. These locked-in docks are girded by rails in direct communication with coal mines which lie at an average distance of 25 miles to the north. The coal is loaded direct from the pit mouth into coal cars carrying an average load of 12 tons each, and trainloads of these are taken to the dock side. Each car is lifted by hydraulic power from the dock side on a hoist, from which the coal is tipped through a shoot into the vessel's hold. The loading time at Cardiff of a considerable number of American vessels was found, in 1918, to be at the average rate of 100 tons per hour. These same vessels had received 1,000 tons per hour at American ports. There is no storing of coal in normal times, and if conditions prevent the free run of coal cars to the ships, there follow congestion on the rails and sidings, shortage of coal cars, and temporary shutting down of the mines. All export coal is sold f. o. b. at the ports, so that costs of haul and loading charges fall on the seller.

The South American Coal-Trade Circuit.

The one important distant market is South America, which in 1913 absorbed 7,000,000 tons, more than 9 per cent of Great Britain's total coal export. It is recognized in coal and shipping circles in Great Britain, that South America is more exposed to the competition of American coal than any other British market. As the outward-bound coal is economically essential to the inward-bound grain, interest in potential and actual competition is national. In normal years British exports to South America have exceeded, in bulk, the imports from there. The movement of vessels clearing from Great Britain has approximated 5,000,000 tons, carrying some 8,000,000 tons of cargo, preponderantly coal, supplemented by cement, machinery, cloth manufactures, etc. Grain and meat provided full return loads for some five-eighths of the outgoing tonnage. This circuit has thus formed one of the most economical exchanges of commodities known.

In pre-war days an outward freight rate on coal of $2.50 per ton and an inward freight rate on grain of $3.50 per ton provided a net return on capital satisfactory to the shipowner. The overplus British tonnage in South America usually proceeded north in ballast and took cargo in the United States for Europe; this circuit also was a reasonably profitable round voyage at normal freights. A fleet of British ships with an aggregate of perhaps 1,000,000 tons measurement annually made the circuit in the other direction, i. e., across the Atlantic in ballast, from United States ports to South America with cargo, and thence to Europe with grain. Should economic conditions transfer, in considerable part, the sources of coal supply

for South America to the United States, it may be expected that British vessels will compete for the transport of the coal. So, also, American vessels taking coal from American ports to South America must necessarily compete for the transfer of grain from Argentina to Europe. The economically impossible alternative is to return in ballast. The vessel must follow the route defined by international exchange of bulk commodities.

The Mediterranean Coal-Trade Circuit.

British shipments to the countries bordering on the Mediterranean and Black Seas normally approximate 25,000,000 tons, of which the great bulk is coal, the chief items of return cargo being grain, ores, oil, and cotton. Import items do not bulk as largely as outward cargoes, hence part of the British disengaged fleet returns to the United Kingdom in ballast, and part proceeds in ballast through the Suez Canal, ultimately to return with cargoes from the Orient, and with grain, etc., from Australia. American vessels carrying American coal to the Mediterranean would find only a limited quantity of bulky products for return cargoes—some Spanish ores, some few ores of a special class from the Black Sea, etc.—and would necessarily compete for freights from the Mediterranean to Great Britain and the North Sea ports, Rotterdam, Antwerp, Hamburg, etc., completing the round by returning to the United States in ballast. Many of the cargoes from the Mediterranean are discharged in North Sea ports, and British vessels have completed the circle by proceeding in ballast to the home port for bunkers to start a new voyage. In the past such vessels have brought immense quantities of cargo, principally German, from North Sea ports to ports of the United Kingdom at ballast rates. Thus Germany, favored by such tonnage conditions, was able to export partly manufactured steel and iron, sugar, etc., in vast quantities to Great Britain at freight rates which would not be regarded, under other conditions, as remunerative to the shipowner.

It may be noted in connection with British shipments of coal to the Mediterranean, that these include supplies for British naval and commercial coaling stations. To Gibraltar and Malta, for instance, were sent, in pre-war years, about 300,000 tons each, increased abnormally in 1918 to 1,600,000 tons to the former and 1,200,000 to the latter. The supply to Egypt, including the great depot at Port Said for the Egyptian railways, might normally be about 3,000,000 tons, but was reduced approximately one-half during the war. It may be assumed that shipments of United States coal to Egypt are unlikely to continue after the period of adjustment of coal production and distribution to peace conditions.

Coal Shipments to Italy—Government Control—American Shipments.

Italy, without coal and an importer of all its fuel, has, in the past, been the largest buyer from Great Britain, with the exception of France. It offered a continuous and expanding pre-war market, rising toward 10,000,000 tons per annum. It received 4,000,000 tons in 1918 from Great Britain, all shipped under Government control of both countries, at officially fixed prices and freights. British coal exporters who have established themselves in Genoa

and other Italian ports, have energetically protested against the declared Italian intention of making coal import a Government monopoly. In the absence of knowledge as to whether official control of this industry will cease, and if so, when, it is impossible intelligently to forecast developments. American shipments to Italy began in the year 1912, when the great South Wales coal strike stopped supplies of British origin, and grew to a maximum of 1,714,000 tons in 1915, thereafter declining rapidly as ship shortage and submarine activity progressed. In 1918 a part of Italy's needs were supplied by rail from France, that country in turn being guaranteed by Great Britain the amount thus sent to Italy.

The Baltic Coal Circuit.

In pre-war times, Germany was Great Britain's third best customer for coal, and in 1913 British shipments to Russia exceeded 4,000,000 tons. More than half the ships which cleared for Hamburg from Great Britain were coal laden. Great Britain successfully supplied Hamburg with coal in competition with Westphalian coal. In the ports of eastern Prussia, British coal was sold side by side with the output of Silesia. Return cargoes consisted of timber, grain, flax, linseed, and oil cake, and from Finland and Sweden, of paper pulp. It is assumed that when conditions become normal, coal exports to the Baltic will be resumed on a large scale, as the bulky products of the countries bordering on that sea are vitally necessary to British industries. It is not thought that the United States has a potential competitive interest in coal shipments to the Baltic.

British Coal Trade with France.

British trade with nearby countries bordering on the Atlantic Ocean and the North Sea is more like coasting trade than international exchange of commodities, and much of the coal shipped is carried in small, specially constructed vessels under 2,000 tons deadweight, equipped to enter small harbors, particularly in France, and to bring back from there and from Portugal the fir woods for timber so essential to the mining industry. British shipments to France in 1913 amounted to 13,000,000 tons. Important exporters of South Wales, concentrating on French business, have carefully studied and provided for French needs. A coal known in France as Cardiff Roche is a combination of house coals, maintained at a uniform standard and mixed by loading the vessel from coal cars from different mines. Anthracite is shipped, usually from Swansea, locomotive coal from Newport, Monmouthshire, and Admiralty coal for naval vessels and passenger liners, from Cardiff. It is believed, locally, that in the future, no matter how great may prove to be the increased French domestic supply, large shipments will continue to be made from South Wales, and that on the coast and for a certain distance inland, British coal will be able to meet the French product in price. It may be mentioned that British shipments to France in 1918, nearly 17,000,000 tons, were made for British, French, and American use in that country, all under official control and at the sacrifice of British domestic needs and of distant commercial markets. France is the only country which in 1918 received more than its normal annual average of British coal.

Trade with Portugal, Spain, Norway, and Sweden.

Portugal was a pre-war purchaser of British coal to an amount exceeding 1,000,000 tons per annum. Its return cargoes of pit props and wine in the wood, with upper-deck loads of fruit, provide a full ship, though some specially constructed, small vessels find it advantageous to get away quickly by returning empty. Spain returns heavy shipments of ore, principally its 60 per cent iron ore, the main supply of the British blast furnaces. It is reasonable to believe that Spain, especially as regards its Mediterranean ports, is a potential peace market for American coal, and that with an adequate mercantile marine, a continuous exchange of American coal for Spanish ores may be effected. The pre-war Spanish consumption of British coal exceeded 2,000,000 tons. Shipments in 1918 fell below 500,000 tons, and as this was sold and carried to a neutral country under unrestricted price and freight, prices c. i. f. rose to fantastic heights, often exceeding $100 per ton.

British coal shipments to Norway, in 1918, amounted to 1,250,000 tons; and to Sweden 1,000,000 tons. It is expected that in the long run, the proximity of British ports will be a decisive factor in the supply of coal to Scandinavia.

British War-Time Shipments of Coal.

The following official table shows the exports of British coal during the war years, compared with the record year immediately preceding the war:

Year.	Cargo.	Coke.	Patent fuel.	Bunkers.	Total.
	Tons.	*Tons.*	*Tons.*	*Tons.*	*Tons.*
1913	73,400,118	.....	3,905,436	21,031,550	98,338,104
1914	59,039,880	1,971,413	1,446,981	18,535,616	80,993,890
1915	43,534,560	1,683,836	1,102,564	13,630,965	59,951,925
1916	38,351,553	2,469,163	1,192,225	12,988,172	55,001,113
1917	34,994,887	2,131,977	1,373,645	10,227,952	48,728,461
1918	31,274,015	1,600,000	1,300,000	8,756,476	42,930,491

Comparison of Pre-War and War-Time Coal-Mining Operations.

The following figures, showing the pre-war coal production in the United Kingdom, were officially submitted in March, 1919, to the Coal Mines Commission. Figures in parentheses represent the average of the years 1912 and 1913, while the other figures represent the average of five years up to 1913: Output of coal, 270,000,000 tons (274,000,000 tons); average value per ton at pit head, $2.13 ($2.34); profits after deducting depreciation, figured at $3,600,000, and before charging royalties and interest, $92,900,000 ($119,700,000); deducting royalties of $29,000,000, in each period, leaves profits of mine owners on share and loan capital, $63,900,000 ($90,700,000), which represents for each ton raised, $0.24 ($0.33); persons employed, 1,048,956 (1,089,817); tonnage raised per person employed 257, (252). In the year 1913 the estimated wages paid to mine workers amounted to $442,800,000, making the wage cost per ton of coal mined $1.50 on the 287,000,000 tons produced that year, and the earnings per person employed, $399 per annum.

For the purpose of comparison, figures for the above items for the periods January–June and July–September, 1918, based on statis-

tics of the Coal Control and expressed as equivalent annual figures, are given below. The figures in parentheses represent the July–September period, and are based on 78 per cent of the total tonnage, while the other figures represent the January–June period and are based on 84 per cent of the total tonnage: Output of coal, 236,300,000 tons (218,400,000 tons); average value per ton at pit head, $4.86 ($6.04); profits after deducting depreciation figured at $3,600,000, and before charging royalties and interest, $126,000,000 ($219,-000,000); deducting royalties of $29,000,000 in each period, leaves profits of mine owners on share and loan capital, $97,000,000 ($190,-000,000), which represents for each ton raised, $0.41 ($0.87); persons employed, 966,355 (929,524); tonnage raised per person employed, 245 (236); estimated wages, $610,700,000 ($588,800,000) plus war wage of $90,000,000 ($175,200,000), making employees' total earnings $700,700,000 ($764,000,000); earnings per person employed, $725 ($822) per annum, and the wage cost per ton of coal mined, $2.96 ($3.50).

It will be noted that the annual profit of operators, after deducting royalties and sum allowed for depreciation, rose from the immediate pre-war figures of $90,700,000 to a sum in the third quarter of 1918, calculated on an annual basis, amounting to $190,000,000, on a greatly reduced output. It should be explained that of this increased income, less than 15 per cent accrued to the mine owners. Various regulations as to excess-profits tax, as to a pool out of which the Coal Controller made good losses to nonpaying collieries, etc., caused most of the money to flow into official channels.

Per Capita Output Declined While Cost per Ton Increased.

The fall of British coal production per man employed, and the increased cost per ton produced have aroused grave concern, not only among those directly interested but also throughout the country. The per capita reduction in output throughout the United Kingdom has, in 11 years, fallen 54 tons from 294 tons in 1907 to 240 in 1918. The production in the South Wales field, 242 tons in 1908, fell to 224 tons in 1918. South Wales only produces 20 per cent of the total output of the country, but exports nearly 50 per cent of the total export. It has long been the costliest coal anywhere to produce on a large scale, and the progressive diminution of per capita production is noted with a special concern. The average wage cost per ton in the United Kingdom, in 1913, is given above as $1.50, rising at the end of 1918 to $3.50, an advance of over 130 per cent; but the advance in South Wales has been actually and relatively greater than this. The per capita production of the United Kingdom in 1912–13, 252 tons, cost in wages per man employed, $399; while production at the rate of 235 tons per annum in the autumn of 1918, cost in wages $822. In South Wales, in 1918, the 224 tons per man produced, cost $959 per man.

South Wales Coal Production—Decline of 1918 and Its Causes.

The South Wales coal field produced 46,000,000 long tons of coal in 1918, a decrease of 11,000,000 tons from the production of 1913 and of 2,500,000 tons from that of 1917. Various factors contributed to this result. Though the same number of miners were employed in the

field at the beginning of 1918 as at the outbreak of the war, the new employees who replaced those who had enlisted were not so skillful, and their individual output was less. About 20,000 of the young and most vigorous men were taken for army purposes early in 1918. Heavy losses in output resulted, in the spring, from shortage of ships. A number of mines were shut down for days together for want of vessels which had been diverted from coal carrying to meet more pressing needs, and other mines at times were closed because rolling stock had been so depleted by requisitions for France and elsewhere that there followed a shortage of locomotives and coal cars. Some hundreds of thousands of tons of output were lost through the influenza epidemic and through a number of strikes of limited duration. These statements apply generally, and account for the falling off in all the British fields.

Coal Prices.

The official price for best, large, Admiralty coal, reserved exclusively for Government use, was, throughout the year 1918, per long ton, $8.02 f. o. b. Cardiff. The price of best smokeless coal and of best household coal was $8.02 per ton to France and Italy for the first half of 1918, and $8.63 to other Allied and home buyers. After July 5 the price to all Allies, including France and Italy, was $9.72. To neutrals the premium price was $12.15 and as much as the seller could obtain, conditional on securing permit for the sale. Prices for home consumption were fixed in 1916 at $1.57 per ton above the pre-war price at the particular pit mouth, and in July, 1918, this allowed increase was doubled, making it $3.14. Individual pit-mouth prices varied greatly in accordance with the quantity of coal, but a fair estimate of the average for good domestic coal at the pit mouth for the last part of 1918 is $7.77. Adding to this the cost of railway transportation and immediate profits, the final cost to the consumer, delivered, was about $10.22 per ton.

Coal Miners' Wage Increases During the War.

Calculations as to miners' wages in the South Wales coal field are highly technical, are based on an obsolete standard of production which included only large coal and ignored small coal, and are expressed by percentage increases calculated on an artificially chosen basis. The following statement as to wages was issued by the Coal Owners' Association of South Wales:

The cost of labor in the South Wales coal field has increased from about $2.84 per ton, based on the output of large coal, to approximately $6.37 per ton, and that of stores from about $0.89 to nearly $2.15 per ton. In May, 1915, the miners in the coal field were granted a war bonus of 17½ per cent, and in August, 1915, a further advance of 12½ per cent. In December, 1915, there was a reduction of 5 per cent, but in June, 1916, there was an increase granted of 15 per cent; in December, 1916, another increase of 15 per cent; in September, 1917, the Coal Controller granted a special war wage of $0.36 per day to adults and of $0.18 per day to boys under 16, and in July, 1918, increased that special war wage to $0.73 per day in the case of men, and to $0.36 per day in the case of boys, both these special war wages being payable whether the men worked or not, so long as they were willing to work; and in October, 1918, a further concession was made of payment of the war wage on overtime.

The effect of these increases has been to secure for the highest-paid day wage men a minimum weekly wage 87 per cent higher than they had before the war, for the medium-paid, underground, day wage men an increase of 134 per cent, and for the lowest-paid day wage men an increase of 200 per cent. In

addition to these advantages, the miners since 1914 had been given a standard minimum percentage equal to the pre-war maximum percentage; a bonus turn previously paid to only a number of men employed on the afternoon and night shifts has been extended to all men employed on those shifts; the wages of all the lower-paid day wage men have been leveled up; and the miners have continued to receive their supplies of house coals at the low nominal pit-head, average price of about $1.46 per ton, and have been exempted from the increased prices charged to other consumers, as well as from the rationing provisions of the Household Fuel Order, 1918.

Pre-War Miners' Wages Compared with Those of 1918.

Official figures given out by the South Wales Coal Owners' Association show the weekly (48 hours) wages paid to 40,000 skilled miners, from which it appears that 27,000 received less than $14.60 per week in July, 1914, but that all excepting about 700 were earning more than this in November, 1918, and that nearly 26,000 were in receipt of a weekly wage exceeding $21.90 at that time. These figures appear in the following table:

Weekly wage.	July, 1914.	November, 1918.	Weekly wage.	July, 1914.	November, 1918.
	Employees.	*Employees.*		*Employees.*	*Employees.*
$9.73 to $12.16	16,993	177	$34.06 to $36.49	22	1,476
$12.16 to $14.60	10,481	504	$36.49 to $38.93	17	946
$14.60 to $17.03	6,519	1,168	$38.93 to $41.36	10	650
$17.03 to $19.47	3,202	2,077	$41.36 to $43.80	5	364
$19.47 to $21.90	1,608	9,834	$43.80 to $46.23	1	233
$21.90 to $24.33	780	6,298	$46.23 to $48.67	1	171
$24.33 to $26.76	379	5,479	Over $48.67	2	330
$26.76 to $29.20	151	4,377			
$29.20 to $31.63	101	3,384	Total	40,311	39,736
$31.63 to $34.06	39	2,208			

When the war broke out in August, 1914, the general wage rate was at the old maximum of 60 per cent above the standard rates of 1879. The following table summarizes the war-time percentage wage advances over the standard wages of 1915 and of 1879:

Date of advance.	Advance.	Percentage advance over standard of—	
		1915	1879
1915:			
May 3	17.5 per cent	.....	77.5
Aug. 21	12.5 per cent	30.8	96.2
Dec. 1	5 per cent [a]	[a] 25.8	[a] 88.7
1916:			
June 1	15 per cent	40.8	111.2
Dec. 1	15 per cent	55.8	133.7
1917, Sept. 17	$0.35 and $0.18 [b]	.....	.....
1918, July 1	.....do.[b]	.....	.....

[a] Reduction. [b] War bonus granted by the Coal Controller to adults and boys, respectively.

War-Time Wage Increases, by Classes of Workmen.

The following table expresses the above percentage advances over the previous standards in actual wages, and shows the weekly wages received by the different classes of mining employees. The bonus turn referred to in the table was a payment made by agreement to certain classes for an extra unworked shift. The concession really placed the wages of the afternoon and night men, who did no work

on Saturdays, on the same basis as the day men who worked six days (eight-hour shifts) per week:

Classes of workmen.	July, 1914.		July, 1918.
	Exclusive of bonus turn.	Inclusive of bonus turn.	
Timbermen (day wages)	$8.84	$10.60	$19.86
Rippers	8.09	9.71	18.55
Assistant timbermen	6.67	8.01	16.07
Assistant rippers	6.67	8.01	16.07
Roadmen	7.18	8.62	16.96
Riders (over 18 years)	7.52	9.02	17.55
Hauliers (day rate)	7.58	9.10	17.73
Hauliers (night rate)	7.26	8.72	17.73
Trammers (over 18 years)	6.33	7.58	15.73
Laborers (over 18 years)	5.76	6.91	15.75
Ostlers	5.92	7.10	15.75
Underground enginemen:			
Main haulage (adults)	6.45	7.75	15.75
Subsidiary haulage (adults)	6.00	7.22	15.75
Underground pump men:			
Main pumps (adults)	6.39	7.58	15.75
Small pumps (adults)	5.78	6.93	15.75
Fitters	6.57	7.89	15.91
Electricians	6.77	8.13	16.25
Rope spliccrs	7.62	9.14	17.73
Masons	8.35	10.02	19.01
Pitmen	8.27	9.91	18.87
Shacklers and sprag men	5.68	6.81	15.75
Lamplockers	5.25	6.31	15.75
Lamplighters	5.37	6.45	15.75
Oilers (oiling sheaves, rollers, etc.)	5.37	6.45	15.75
Coal cutter men	6.33	10.52	19.74
Airway men	7.60	9.12	17.69
Water men (watering roads)	5.90	7.08	15.75
Cog cutters	6.73	8.09	16.19
Timber drawers	7.46	8.94	17.45
Bottom cutters:			
Cutting hard bottom	7.91	9.49	18.21
Cutting soft bottom	7.06	8.48	16.76
Assistant bottom cutters	6.18	7.42	15.75
Sheaf men, roller men, and pulley men	6.93	8.31	16.54
Underground banksmen:			
Leading	7.36	8.82	17.27
Assistant	6.81	8.19	16.33
Underground winding enginemen	7.79	9.33	18.02
Pipemen	6.51	7.81	15.79
Rope changers	7.38	8.86	17.33
Slummers (at pit bottom)	6.24	7.50	15.75
Jig hitchers (at top and bottom of incline)	6.81	8.19	16.33
Wallers in working face	6.04	7.26	15.75

Coke and Briquet Production—Mine Timbers Supplied from Home Sources.

The pre-war annual production of coke in the South Wales field was 7,300,000 tons. This was probably increased by 1,700,000 in 1918, practically all of which was used in domestic industries. There were about 2,500 ovens in use, of which more than half were Coppees. In July, 1918, the price of coal having been officially increased, coke makers were subsidized $1.21 per ton on coke sold for domestic purposes.

The British manufacture of briquets is practically confined to South Wales, which turned out 1,500,000 tons in 1918, of which five-sixths were exported to France. The controlled price to the Allies at the end of 1918 was fixed at $9.60 per ton.

Grave difficulties were encountered throughout the war in supplying mine timbers in sufficient quantities to the coal mines of the South Wales fields. Pre-war imports into South Wales exceeded 1,500,000 tons per annum from the Baltic, Spain, and Portugal at average prices, exship, of $5.35 per ton. The controlled prices in 1918 were between $14.60 and $15.80 per ton, but importations were

curtailed by freight limitations to 600,000 tons, and supplies were secured by cutting down home timber, mostly planted for decorative purposes. The Pit Wood Association purchased standing woods throughout the country, and German prisoners, Scandinavian seamen out of work, and women felled the trees, which were distributed to the collieries as needed. Whereas 90 per cent of the coal-mine timbers were imported before the war, a little less than 2,000,000 tons were supplied in 1917 from domestic sources, and in excess of this in 1918. It is not known whether this cooperative supply system will be continued, nor how soon the Baltic and Bay of Biscay sources of supply can again be restored. It is stated that no coal mine in Great Britain which complied with requirements in giving advance notice of needs was compelled to shut down at any time for want of timber. Afforestation schemes of considerable extent are projected under official direction and with Government support.

Steel and Iron—Fall in Production.

South Wales production of pig iron in 1918 is stated to have fallen considerably from the 1917 output of approximately 1,000,000 tons. Shortage of ore, of labor, of scrap, and of coal at different times accounted for the diminution. Fifteen furnaces (12 hematite, 3 basic) were in blast at the end of the year, using principally Spanish ores, with some from England and a small quantity of local production. All steel industries were under official control, producing principally ships' plates, other material for ship construction, and alloy shells. The plants throughout the district have been modernized and will be able, on resuming pre-war activities, greatly to increase the output of tin-plate bars and the production of galvanized sheets. The production of galvanized sheets has been greatly curtailed and no effort made to hold neutral, British colonial, or oriental markets. The exports of these sheets in the year 1913 amounted to an aggregate of 702,000 tons, and were nominal in 1918. The controlled price for locally produced pig iron was from $30 to $34.50 per ton f. o. b. during the year. The price for export was fixed in December, 1918, at $42.07.

Production of tin plates fell approximately from the 577,000 tons in 1917 to 346,000 tons in 1918. The number of mills working in South Wales when the armistice was declared was 255. This represents a reduction of just one-half as compared with 1913. In that year tin plates were shipped to the following countries, which received none in the year 1918: Russia 9,900 tons, Germany 5,000 tons, Netherlands 43,000 tons, Belgium 13,500 tons, Roumania 11,000 tons, and United States 21,500 tons. To Italy were supplied, through the war years, an average approximating its immediate pre-war import of 20,000 tons. Shipments to France increased from 21,000 tons in 1913 to 48,000 in 1918. Exports to China and Japan fell from pre-war shipments of 50,000 tons to nominal, while those to the British East Indies were reduced from 70,000 tons to little more than half. Shipments to Australia were maintained under difficulties until 1917, when they fell from 40,000 tons to 17,000 tons, but recovered to 44,000 tons in 1918.

War-Time Shipping Losses.

A large fleet of cargo-carrying vessels is owned in or controlled from South Wales ports. Compilation of losses is neither com-

plete nor exact, but an unofficial estimate has been made by a competent authority to the effect that 120 Cardiff-owned ships have been lost by enemy attack or mines, the total amounting to an approximate 480,000 tons; this would make the monetary loss, figuring the average value per ton at $90, $43,200,000. The fleet of one firm has been reduced from 30 to 9 vessels, of another from 22 to 6, of a third from 19 to 7, and so on through a list of considerable length. But these firms received insurance at contemporary values, often at figures representing four or five times the original cost of the ships, which resulted in an increase of their capital reserves. The immediate pre-war price of new cargo tonnage was about $25 per ton of dead-weight carrying capacity, and no price exceeding $125 was paid locally during the war. The immediate result of the armistice was to double, or more than double, the efficiency of each vessel. The convoy system, the necessity for following devious courses, and the delays while awaiting instructions, consumed double time. After the war it was found that a vessel carrying coal to France could make two voyages in the time in which one war voyage was completed.

American Coal-Carrying Ships—Government Time-Charter Rates.

The number of American vessels, including repeated voyages, which in 1918 entered the ports of Cardiff, Newport, Barry, and Penarth was 193. Nearly all were army transports and were engaged in carrying coal to French ports for American troop transports, and for locomotive and other uses in France. Seamen entering the ports in 1918 as officers and crews of American mercantile vessels, numbered 7,025, of whom 1,879 were American citizens, 2,919 citizens of Allied nations, and 2,227 neutrals.

At the beginning of 1918 practically all British vessels carrying coal from South Wales ports were requisitioned. Nearly all neutral vessels were Government-directed under time charters, and all non-British, Allied vessels were operating under the direction of their respective Governments. British time-charter rates to British cargo vessels, from March 1, 1918, through the year were: For vessels of 3,000 tons dead weight, $4.14 per gross registered ton per month; 4,000 tons dead weight, $4.01 per gross registered ton; 7,000 tons dead weight, $3.41; and over 7,000 tons $3.28; the vessel in each case finding and feeding the crew.

In the following table are given the maximum freight rates, as officially fixed January, 1919, for coal cargoes out of Cardiff to various ports, with the average rates for the year 1914:

Ports.	Average freight rates per ton.	
	1914	1919
Alexandria, Egypt	$2.50	$11.56
Algiers	1.78	9.49
Buenos Aires	3.43	17.03
Genoa	2.15	11.56
Havre	1.24	8.67
Marseille	2.10	11.31
Montevideo	3.29	(a)
Naples	2.20	11.07
Rio de Janeiro	3.40	26.01

a No fixed rate.

Declared Exports to United States.

Declared exports to the United States from this district during 1918 amounted in value to only $21,949, consisting of iron chains $19,805, other iron and steel manufactures $470, and manetti, under three years, $1,674. There were no shipments to either Porto Rico, Hawaii, or the Philippine Islands.

SWANSEA.

By Consul M. K. Moorhead.

According to advance information supplied by the harbor authorities, the total sea-borne trade of the three principal ports of the Swansea district (Swansea, Port Talbot, and Llanelly) amounted to 5,929,885 tons during 1918, compared with 6,321,576 tons in 1917, 8,212,898 tons in 1916, 8,650,463 tons in 1915, 8,803,068 tons in 1914, and 10,641,271 tons in 1913. The following table shows the imports and exports, in tons of 2,240 pounds, through each of the three leading ports of the Swansea district during the past four calendar years and the calendar year 1913:

Trade	1913	1915	1916	1917	1918
IMPORTS.	*Long tons.*	*Long tons.*	*Long tons.*	*Long tons.*	*Long tons.*
Swansea	1,096,999	809,003	671,324	497,965	424,181
Port Talbot	278,175	217,137	190,365	178,501	200,194
Llanelly	182,475	70,815	23,138	6,556	2,569
Total	1,557,649	1,096,955	884,827	683,022	626,944
EXPORTS.					
Swansea	6,134,251	5,067,474	4,484,769	3,734,765	3,724,815
Port Talbot	2,519,671	2,261,078	2,622,354	1,710,699	1,470,518
Llanelly	429,700	224,956	220,948	193,090	107,608
Total	9,083,622	7,553,508	7,328,071	5,638,554	5,302,941
Total trade	10,641,271	8,650,463	8,212,898	6,321,576	5,929,885

Large Decrease in Trade from That of 1913.

The total sea-borne trade of the three leading ports of the Swansea district decreased during 1918 from the trade of the pre-war year 1913 by 4,711,386 tons, or 44 per cent; imports by 930,705 tons, or 59 per cent; and exports by 3,780,681 tons, or 41 per cent. At Swansea the imports declined by 672,818 tons, or 61 per cent, and exports by 2,409,436 tons, or 39 per cent. At Port Talbot imports decreased by 77,981 tons, or 28 per cent, and exports by 1,049,153 tons, or about 41 per cent. At Llanelly imports decreased by 179,906 tons, or 98 per cent, and exports by 322,092 tons, or 75 per cent.

The small decrease in the import trade of Port Talbot, compared with Swansea, during 1918 as against 1913, was due, first, to the fact that in 1913 the new dock at Port Talbot was not completed, and with the completion of the dock in 1915 that port was in a position to handle greatly increased shipping; and, second, to the fact that increased productive capacity of the steel mills and blast furnaces at Port Talbot brought about much larger imports of iron ore and pig iron.

During the war, the trade of Llanelly declined to a remarkable extent on account of the shortage of shipping and because the

exports of coal and tin plates and the imports of pig iron, scrap iron, and timber were diverted to Swansea.

Imports at Swansea were Mostly of Raw Materials.

The direct imports by sea at Swansea during 1918 amounted to 424,181 tons, showing a decrease of 73,784 tons compared with 1917; 247,143 tons compared with 1916; 384,822 tons compared with 1915; 581,663 tons compared with 1914; and 672,818 tons compared with the pre-war year of 1913. Most of these imports consisted of raw materials for the steel mills and smelting plants, such as iron ore, pig iron, steel bars for the manufacture of tin plates, zinc, copper, nickel, and sulphur ores; pit wood for the coal mines; timber for building; grains, fish, and other food products; and pitch for the manufacture of coal briquets.

The principal articles imported by sea at Swansea during the pre-war year of 1913 and the past four calendar years, 1915 to 1918, are given in the following table:

Articles.	1913	1915	1916	1917	1918
Breadstuffs:	*Long tons.*	*Long tons.*	*Long tons.*	*Long tons.*	*Long tons.*
Grain (wheat, barley, and corn)	90,068	99,232	89,657	69,057	51,426
Flour	18,640	18,674	14,991	4,377	20,937
Coal, gas	3,919	776	568	270	.....
Copper, silver, lead, and tin ores and alloys	58,268	38,342	37,499	10,501	3,833
Earthen and stone ware (bricks, tiles, slates, and cement)	37,038	25,667	15,670	13,035	17,784
Fish	7,881	5,588	5,153	4,081	5,201
Iron ore	77,337	79,828	64,674	65,070	78,037
Iron and steel manufactures:					
Iron in pigs, scrap iron, and steel	131,457	83,399	33,891	62,911	17,077
Steel bars and billets	44,102	5,699	537	12,023	.....
Sugar	15,332	1,809	1,740	590	530
Sulphur ore	63,456	73,711	116,695	27,552	14,252
Tar and pitch	64,521	33,115	23,292	5,695	1,199
Wood:					
Deals, battens, and boards	65,876	36,196	17,523	10,717	1,990
Pit wood	137,496	93,169	91,586	47,731	57,481
Zinc ore and alloys	39,827	58,018	54,958	86,499	79,809
All other articles	241,778	155,759	102,893	78,908	74,625
Total	1,096,999	809,003	671,324	499,017	424,181

Increased Output of Swansea Spelter Works.

During 1918 there were large decreases in nearly every class of goods imported by sea at Swansea, as compared with the pre-war year of 1913, with the exception of flour, iron ore, and zinc ore. Flour in 1918 showed a small increase of 2,297 tons, iron ore 700 tons, and zinc ore 39,982 tons, as compared with 1913. In 1918, however, the imports of iron ore, from Spain, amounted to 78,037 tons as compared with only 65,070 tons in 1917 and 64,674 tons in 1916. Zinc ore and alloys in 1918 showed a decrease of 6,690 tons from 1917; an increase of 24,851 tons over 1916, and of 21,761 tons over 1915; but a decrease of 4,095 tons from 1914, and an increase of 39,982 tons over 1913. The imports of zinc ore and alloys in 1917 were the highest on record, reaching a total of 86,499 tons, or 46,672 tons more than during the normal year of 1913. The decrease in 1918 from 1917 was due to the difficulty of getting supplies from Mediterranean ports and Australia on account of the shortage of tonnage.

The increase in zinc ore imports during the war over 1913 was due to the large extensions made in the Swansea spelter works for war purposes. Previous to the war the Swansea spelter works were unable to compete with the German and Belgian smelters, which

obtained most of their supplies of ore from Australia. With the outbreak of war this competition was removed and large extensions were made to the Swansea works. On the whole the import trade of Swansea during 1918 was most unsatisfactory, the total trade being the lowest on record, due to restrictions on imports and shortage of tonnage. It should be noted, however, that these figures apply only to direct imports by sea, and do not represent the real consumption of imported goods in the district. Large quantities of hardware, tools, clothing, frozen meat, canned fish, fruits, vegetables, and breakfast foods are brought into Swansea from the large distributing centers in England, such as London, Liverpool, Manchester, and Birmingham.

War-Time Decreases in Sea-Borne Imports—Iron and Steel Imports.

The principal decreases in imports at Swansea, by sea, during 1918, as compared with 1913, were as follows:

	Long tons.
Iron, steel, pig iron, and castings	114,380
Pit wood	80,015
Deals, battens, and boards	63,886
Tar and pitch	63,322
Copper and other ores, n.s.p.f	54,435
Sulphur ore	49,204
Steel bars (none in 1918)	44,102
Grain	38,642
Bricks, slates, and cement	19,254
Sugar (only 530 tons in 1918)	14,802

The imports of iron and steel products by sea from Swansea during the calendar years 1913, 1915, 1916, 1917, and 1918, according to the returns of the Swansea Harbor Trust, were as follows:

Imports.	1913	1915	1916	1917	1918
	Long tons.	*Long tons.*	*Long tons.*	*Long tons.*	*Long tons.*
Iron ore	77,337	79,828	64,674	65,070	78,037
Pig iron, scrap, etc	131,457	83,399	33,891	62,911	17,077
Steel bars and billets	44,102	5,699	537	12,023	.....

Manufacture of Steel Bars a Large Industry.

One of the principal industries of the Swansea district is the manufacture of steel bars used in the making of tin plates. The normal productive capacity of the tin-plate mills is estimated at about 925,000 tons. For the manufacture of these tin plates, slightly over 1,000,000 tons of steel bars are needed. Figures of the total production of tin-plate steel bars in the Swansea area are not available, but there is no doubt that the production does not equal the demand, so that recourse to importations has been necessary. In the normal year of 1913, approximately 40,000 tons were imported by sea, and the rest of the needed supplies were obtained from other sections of the United Kingdom. During the war, however, sea-borne imports into Swansea have steadily declined to 5,699 tons in 1915; to 537 tons in 1916; to 12,023 tons in 1917; and to nothing in 1918. This, however, does not mean that the total imports have been less. Owing to the war all imports of steel have been under the control of the Government and have been made directly by the Ministry of Munitions. No doubt a considerable quantity of steel has been supplied to local mills by the Government through imports made through ports out of the Swansea district.

Imports and Production of Pig Iron.

The imports of pig iron at Swansea during 1918 were only slightly larger than the imports of the year 1913—the figures for 1918 being 78,037 tons, and those for 1913, 77,337 tons. The imports in 1918 came entirely from Spain.

It is estimated that there is now produced in the Swansea district 45,000 tons of basic pig iron per annum, and 48,000 tons of hematite pig iron. The entire production is manufactured by one firm, Messrs. Baldwin (Ltd.), at their works at Landore and Briton Ferry. This company is erecting another blast furnace at Port Talbot, capable of producing about 45,000 tons. According to official returns of the British Government, there were imported at Swansea by sea, in 1913, 23,228 tons of pig iron and puddled bars, valued at £73,559 ($357,975), and in 1917, the last year for which statistics are available, 4,446 tons, valued at £27,752 ($135,055). According to the same source, 43,488 tons of scrap iron and steel were imported into Swansea in 1913, as compared with only 2,324 tons in 1917.

Home Production of Mining Timber Replaces Imports.

Previous to the war the imports of mining timber (pit wood and pit props) amounted on the average to 1,750,000 tons, the bulk of which came from France, Spain, and Portugal, besides considerable quantities from the Baltic ports, chiefly Finland. By 1916 these imports were reduced to 1,300,000 tons, and in 1917 a further decrease took place, so that in 1918 the imports probably amounted to not over 600,000 tons. Early in the war imports from the Baltic ports ceased entirely, and very little was obtainable from Spain and Portugal on account of the excessive freight charges. Imports from France declined on account of the shortage of labor in France and difficulty in obtaining vessels for transportation. With the reduction in imported pit wood to 600,000 tons per annum, it was necessary for the coal mines to obtain an equal amount through local production. In order to increase local production, the Government imported from Canada expert lumbermen to work forests in South Wales. From January 1 to September 1, 1918, approximately 210,000 tons of pit wood was obtained from forests in South Wales. According to the Pit Wood Allocations Committee, the amount of pit wood consumed by the coal mines in South Wales during the year ended December 31, 1918, was 1,273,400 tons, and the total delivered to the mines amounted to 1,253,544 tons.

The imports of pit wood at Swansea and Port Talbot during the past seven calendar years, in loads of 50 cubic feet, were as follows:

Years.	Swansea.	Port Talbot.	Total.
	Loads.	*Loads.*	*Loads.*
1912	128,318	80,363	208,681
1913	152,033	74,695	226,728
1914	105,746	60,478	166,224
1915	102,117	42,196	144,313
1916	100,918	51,697	152,615
1917	50,020	28,854	78,874
1918	57,481	19,377	76,858

Principal Kinds of Timber in Demand—Timber Imports.

The principal timber used in this district is spruce for joisting buildings, and pine for doors and finer work. Poplar is used for crossties and brake blocks on railway cars. Oak is required in large

quantities for railway cars. There is also a small demand for elm and oak logs for shipbuilding, and pitch pine for masts. The shipbuilding industry in this district is of no importance, although there are a number of dry docks for repairs. The following table shows the imports, in loads of 50 cubic feet, of sawn and split timber and hewn timber at each port in the Swansea consular district during the years ended December 31, 1913 to 1917, according to the official returns of the British Government:

Ports of entry.	1913	1914	1915	1916	1917
WOOD AND TIMBER, SAWN OR SPLIT.	*Loads.*	*Loads.*	*Loads.*	*Loads.*	*Loads.*
Aberystwyth	1,784	581	463	.....	.....
Cardigan	571	382	307	.....	828
Llanelly	13,241	15,015	5,535	2,886	.....
Milford Haven	2,872	2,287	784	2,800	.....
Port Talbot	4,876	4,266	1,298	.....	.....
Swansea	63,447	49,187	36,460	19,150	12,278
Total	86,791	71,718	44,847	24,836	13,106
WOOD AND TIMBER, HEWN.					
Llanelly	1,049	321	158	289	.....
Milford Haven	150	704	.....	.....	.....
Port Talbot	75,751	60,478	42,196	51,408	25,854
Swansea	161,823	106,387	103,144	101,316	50,020
Total	238,773	167,890	145,498	153,013	75,874
Grand total	325,564	239,608	190,345	177,849	88,980

Timber Imports by Kinds.

No official figures are available for the year 1918, but I append hereto a statement furnished by the managers of the Harbor Trusts at Swansea, Port Talbot, and Llanelly, showing the imports of each kind of timber at each of these ports during the calendar years ended December 31, 1914 to 1918:

Kinds of timber.	1914	1915	1916	1917	1918
SWANSEA.	*Long tons.*	*Long tons.*	*Long tons.*	*Long tons.*	*Long tons.*
Deals, battens, and boards	46,331	36,196	17,523	10,717	1,990
Pit wood	94,317	93,169	91,586	47,731	57,481
Total	140,648	129,365	109,109	58,448	59,471
PORT TALBOT.					
Deals, battens, and boards	3,229	983	.....	.....	9
Pit wood	50,924	36,811	53,939	19,904	19,377
Timber (sawn and hewn)	328	82	.....	110	458
Total	54,481	37,876	53,939	20,014	19,844
LLANELLY.					
Timber	13,761	3,899	3,887	.....	(a)
Total	13,761	3,899	3,887	.....	(a)
GRAND TOTALS.					
Deals, battens, and boards	49,560	37,179	17,523	10,717	1,999
Pit wood	145,241	129,980	145,525	67,635	76,858
Timber (sawn and hewn)	14,089	3,981	3,887	110	458
Grand total for three ports	208,890	171,140	166,935	78,462	79,315

a No figures.

Pit Wood Imports Greatly Reduced During War.

Previous to the war large quantities of pit wood for the coal mines in South Wales were imported, mostly from France, Spain, Portugal,

Finland, and Scandinavia. In the spring of 1917 these imports were restricted by Government order for the purpose of economizing the available supply of tonnage. In 1913 the United Kingdom was importing from the above-mentioned countries nearly 3,500,000 loads of pit props and pit wood, a load consisting of 50 cubic feet. These imports amounted to more than 90 per cent of the whole country's natural consumption of mining timber. Of these total imports into the United Kingdom 1,750,000 tons were imported for the use of the coal mines in South Wales. By 1916 the imports of pit wood into South Wales were reduced to about 1,300,000 tons, and in 1917 there was a further decrease.

Attempts have been made to make up the shortage by the utilization of home-grown timber. The Welsh and English timber is not as good a quality as that imported, as it does not follow a straight grain. The imported timber is also lighter in weight. The usual sizes of pit props used in the Swansea district are approximately as follows: 4½ feet by 2½ inches by 4 inches; 5½ feet by 3 inches by 4½ inches; 6½ feet by 3 inches by 6 inches; 9 feet by 3 inches by 7½ inches; 13 feet by 4½ inches by 8 inches. Some timber has recently been imported for the coal mines from Newfoundland and Labrador. It is possible that there might be timber available in the United States for use as pit props, and as this trade is of very great value it might be worth while for American lumber exporters to investigate the possibility of shipping pit wood to Wales.

Government-Controlled Price of Pit Wood—Pit Wood Imports.

The Government-controlled price for pit wood is 65s. ($15.82) per load of 50 cubic feet ex-vessel at the port of unloading or 65s. for home-grown timber at the pit mouth. Prior to the war supplies were received from France and Spain at an ex-ship price of about 21s. to 22s. ($5.11 to $5.35), or one-third less than the present controlled price.

According to the Cardiff Western Mail Trade Supplement of January 1, 1919, the imports and values of pit wood at Swansea and Port Talbot during the calendar years 1913 to 1917 were, in loads of 50 cubic feet, as follows:

Years.	Swansea.		Port Talbot.		Total.	
	Loads.	Value.	Loads.	Value.	Loads.	Value.
1913	152,033	$923,875	74,695	$391,580	226,728	$1,315,455
1914	105,746	488,310	50,478	288,735	166,224	777,045
1915	102,117	831,555	42,196	323,650	144,313	1,185,205
1916	100,918	1,237,290	51,697	681,250	152,615	1,918,540
1917	50,020	628,760	28,854	297,920	78,874	926,680

Tar and Pitch Imports—Grain—Sulphur Ores.

In the pre-war year of 1913 the imports at Swansea of tar and pitch amounted to 64,521 long tons; in 1914 to 53,840 tons; in 1915 to 33,115 tons; in 1916 to 23,292 tons; in 1917 to 5,695 tons; and in 1918 to only 1,199 tons. At Port Talbot in 1913 the imports were 16,743 tons, as compared with 4,501 tons in 1918. The combined imports into the Swansea district of tar and pitch, therefore, amounted to 81,264 tons in the pre-war year of 1913, and to only 5,700 tons in 1918. Most of the pitch and tar is used for binding material in the

manufacture of coal briquets, which is one of the most important industries of Swansea. During the war the shortage of supplies has been made up by local manufacture.

During the pre-war year of 1913 the imports of grain (wheat, barley, and corn) into Swansea amounted to 90,068 long tons; in 1914 to 89,293 tons; in 1915 to 99,232 tons; in 1916 to 89,657 tons; in 1917 to 69,057 tons; and in 1918 to 51,426 tons, the lowest importation of grain on record, due to the shortage of shipping. In 1918 there were completed at Swansea special grain sheds for the prompt handling of imports. But these sheds have not been utilized to any extent.

Sulphur ores, chiefly iron and copper pyrites, are used largely for smelting purposes in the various metallurgical works in Swansea. The imports in 1913 amounted to 63,456 long tons; in 1914 to 63,321 tons; in 1915 to 73,711 tons; in 1916 there was a large increase to 116,695 tons, due to great extensions in the works for war purposes; in 1917 a very large decrease took place, the imports in that year amounting to only 27,552 tons; and in 1918 the decrease continued to only 14,252 tons, the lowest on record. This decrease was due to shortage of shipping.

Swansea's Exports for the Last Five Years.

In the pre-war year of 1913 the total exports of Swansea amounted to 5,419,098 long tons, of which 4,951,036 tons consisted of coal and coal briquets; 411,839 tons of tin plates, galvanized sheets, and other iron and steel products; and 34,981 tons of chemicals, chiefly sulphates of copper and iron. In 1918 the total exports had declined to 3,724,815 tons, coal, coke, and patent fuel alone accounting for 3,459,035 tons; while iron and steel products, mostly tin plates, declined to 149,253 tons.

If quantities alone are taken into consideration, coal is by far the most important export of Swansea, but it is not so great in value as the exports of tin plates and other iron and steel products. In 1913 coal exported from Swansea was valued at $13,339,400, and iron and steel products at $125,148,620. In 1917 the value of coal exported had increased to $19,509,360, and iron and steel products had declined to $19,931,730. Figures of values for 1918 are not available.

The following table shows the exports from Swansea during the five years ended December 31, 1914 to 1918:

Articles.	1914	1915	1916	1917	1918
	Long tons.	*Long tons.*	*Long tons.*	*Long tons.*	*Long tons.*
Coal and coke	3,791,293	3,804,286	3,225,995	2,539,915	2,677,175
Patent fuel	711,141	713,309	817,378	778,588	781,850
Copper, zinc, copper ores, regulus, silver and zinc ores	13,191	9,377	1,599	464	1
Iron, steel, rails, castings, etc	71,893	59,936	7,498	22,975	24,982
Tin, terne, and black plates	415,699	376,185	309,550	158,994	124,271
Galvanized sheets	.....	.....	6,820	1,643	663
Timber	1,131	1,173	.....	.....	.....
Bricks and fire clay	3,053	11,230	.....	.....	.....
Alkali, superphosphate, arsenic, etc	45,678	59,592	13,110	8,114	5,629
Flour, grain, potatoes, etc	20,492	17,043	15,226	19,357	7,397
Ale, stout, and spirits	.....	.....	29	.....	.....
Oil, bark, wool, etc	3,742	7,652	.....	.....	.....
General merchandise (average)	8,500	7,700	87,564	204,715	.....
General merchandise (estimated)	.....	.....	.....	.....	102,837
Total	5,085,813	5,067,474	4,484,769	3,734,765	3,724,815

Trade with the United States.

According to the annual returns of the Swansea Harbor Trust the direct total trade by sea between Swansea and the United States during each of the five years ended December 31, 1914 to 1918, was as follows:

Trade.	1914	1915	1916	1917	1918
	Long tons.	*Long tons.*	*Long tons.*	*Long tons.*	*Long tons.*
Imports	13,986	58,496	70,289	105,354	27,327
Exports	59,661	37,987	20,254	13,756	154
Total	73,647	95,483	90,543	119,110	27,481

Swansea's Direct Imports from United States.

From the outbreak of war until 1918 the direct imports by sea from the United States showed a marked increase, advancing from only 13,986 long tons in 1914 to 58,496 tons in 1915, to 70,289 tons in 1916, and 105,354 tons in 1917. In 1918, however, there was a marked decrease to only 27,327 tons, or very little more than was imported from the United States in 1913.

The following table shows the principal articles imported through Swansea from the United States during each of the five calendar years 1914 to 1918:

Articles.	1914	1915	1916	1917	1918
	Long tons.	*Long tons.*	*Long tons.*	*Long tons.*	*Long tons.*
Agricultural, vegetable, and animal produce for manufacturing purposes	393	4,189	89	446	2,089
Breadstuff	226	24,898	52,346	30,754	17,867
Chemicals	11	7,630	.....	.....	150
Copper	3,986	2,983	4,633	.....	.....
Iron and steel	9,206	14,374	4,604	71,954	6,049
Wood	144	4,342	8,476	2,050	209
Projectiles	.....	.....	.....	.....	709
All other articles	20	80	150	150	254
Total	13,986	58,496	70,289	105,354	27,327

Harbor Trust's Import Statistics.

The manager of the Swansea Harbor Trust has furnished me with more detailed statistics of imports from the United States during the pre-war year 1913 and the year 1918, as follows:

Articles.	1913	1918	Articles.	1913	1918
	Long tons.	*Long tons.*		*Long tons.*	*Long tons.*
Copper produce	2,120	.....	Grain	6,409	12,633
Nickel	.....	150	Flour and provisions	133	5,234
Steel and billets	2,644	500	Phosphate rock	1,809	.....
Iron and machinery	.....	349	Oil and grease	.....	2,089
Projectiles	.....	709	All other articles	701	264
Pig iron	6,169	5,200			
Timber and joinery	6,388	209	Total	25,418	27,327

The large increase in 1917 of imports from the United States was due entirely to large importations of iron and steel products, mostly pig iron and steel bars, amounting to 71,954 tons, as against only 8,813 tons in 1913. In 1918, however, only 500 tons of steel and billets were imported from the United States, as against 2,644 tons in 1913. The imports of pig iron in 1918 were almost normal, being 5,200 tons, as against 6,169 tons in 1913. There is no doubt that

when things become more nearly normal there will be a large demand in this district for the importation of steel bars for the manufacture of tin plates.

Declared Exports to the United States.

The declared exports to the United States in 1918 were the lowest on record, being valued at $26,006. The following table shows the articles invoiced at Swansea during the calendar years 1913 and 1918:

Articles.	1913		1918	
	Quantities.	Values.	Quantities.	Values.
Abrasive materials: Rottenstone....pounds..	29,120	$207	28,890	$946
Animals, live:				
Fowls....number..	6	370	.....	.....
Horses....do....	5	2,526	.....	.....
Bricks....do....	55,050	1,338	.....	.....
Chemicals:				
Nickel sulphate....pounds..	89,794	5,298	220,281	16,646
Nickel ammonia sulphate....do....	.....	.....	57,087	4,232
Oxalic acid....do....	459,897	37,698	2,307	842
Copper:				
Matte....do....	1,686,279	61,491	.....	.....
Scale....do....	33,600	4,770	.....	.....
Regulus....pounds of copper content..	.....	.....	.....	.....
Gold manufactures	.....	361	.....	.....
Hides and skins: Sheep skins....pieces..	32,044	13,071	.....	.....
Household furniture	.....	831	.....	.....
Iron and steel manufactures:				
Black plates....pounds..	61,061	1,210	.....	.....
Black taggers....do....	1,596	109	.....	.....
Terneplates....do....	133,857	7,043	.....	.....
Tin plates....do....	1,508,417	44,932	.....	.....
Tinned sheets....do....	31,555	2,021	.....	.....
Machinery....do....	.....	219	.....	.....
Steel sheets....do....	9,119	281	.....	.....
Wrought iron ladles....do....	2,501	173	35,897	3,340
Nickel manufactures....do....	22,619	8,157	.....	.....
Total	.....	192,109	.....	26,006

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